

**The Effects of Forming a  
Producers' Group on Gum Prices and  
Incomes of Women Gum Collectors in the  
Banaskantha/Patan Region of Gujarat, India**

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### Abstract

This paper examines the case of women gum collectors in the Banaskantha region of Gujarat, India. The women were initially independent small-scale producers who could sell only to local traders. Because of this, they were forced to sell at low prices and buy necessities from the traders at high prices. However, after becoming members of the Self-Employed Women's Association (SEWA), they began to coordinate their production and they ultimately formed a "producer group" (much like a producer cooperative).

**The research question that arises from this is whether the formation of a producer group has helped the gum collectors attain higher prices for their good, and what impact this has had on their incomes.** Studies were conducted in nine villages in Banaskantha in which gum collection is a key source of income. It appears that by forming a producer group, the women eventually gained a better understanding of their rights and options, the nature of the goods they were selling, and the market for gum. With this came the ability to negotiate for better prices, and eventually sell competitively on the open market. Additionally, they gained access to the SEWA network which provided technical assistance, information, credit and other benefits that are not available to producers working alone. Both quantitative and qualitative data indicate that the outcome was a considerable increase in market power, and the move towards monopolistic competition (after passing through stages similar to a bilateral monopoly and then a producer cooperative stage once they were able to sell on the open market) allowed the gum collectors to attain higher gum prices, higher incomes, and subsequently a higher standard of living.

*Word Count: 272*

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The author would like to express his deepest thanks to Mr. Keith Jones, Ms. Renana Jhabvala (of SEWA), Ms. Mita Parick and Ms. Jignasa Dave (of SEWA Academy), SEWA members of Radhanpur and Antarnesh, Mr. David Birchenall, and others who made this research possible. Discussions with individuals in SEWA's cooperatives division (Gujarat State Women's SEWA Co-operative Federation) and its marketing branch (SEWA Gram Haat), as well as with individuals connected with the State Forest Department and other experts on cooperatives and non-wood forest products (NWFPs), also provided important information for this study. All of their contributions are gratefully and sincerely acknowledged.

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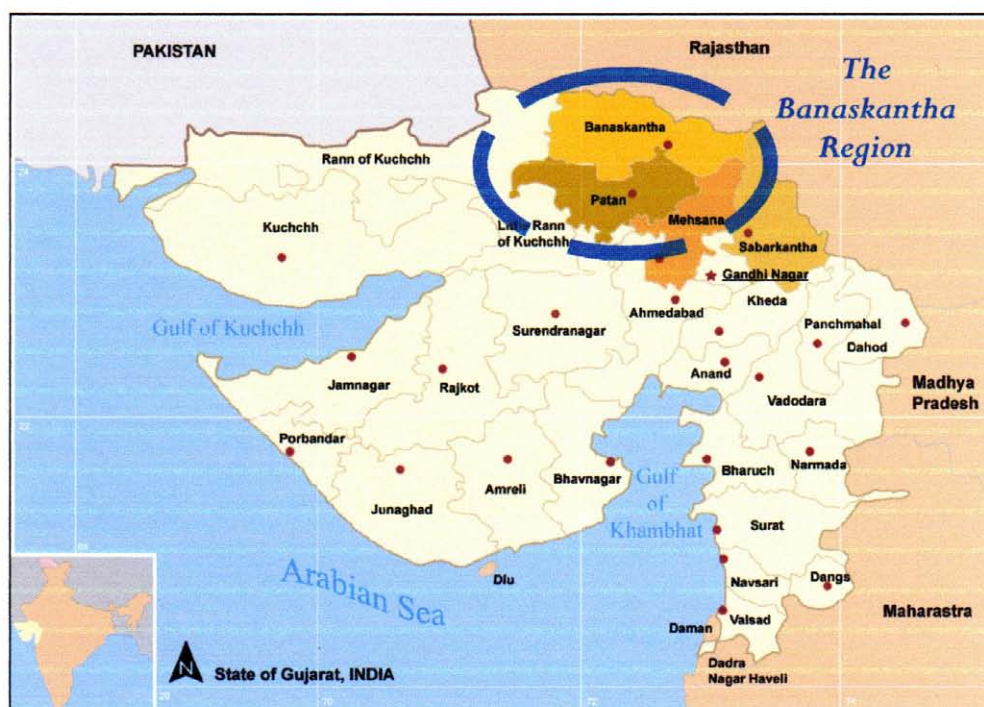
## Introduction

Of all branches of the arts and sciences, few fields provide as insightful a view on how the world works as does the study of economics. Economists combine both theory and practice in the attempt to find insights how people behave as they try to produce, buy and sell goods and services. With all the variety present in different types of markets and conditions throughout the world, it would be incorrect to claim that modern economists have a model that covers every circumstance. Still, economic theory is often considered a solid base of knowledge which can be effectively used to analyze and predict economic behavior around the world.

The following essay will focus on a case study in the field of development economics that also draws on the theory of the firm, as well as other economic concepts. In development economics, it is always important to consider not only pure economic data, but also the economic and social context that provides the framework for what is being studied. This research became an intriguing opportunity to encounter and analyze ideas and theories not always discussed in a standard classroom environment.

This essay follows a case study that focuses on women gum collectors in the Banaskantha/Patan districts of the state of Gujarat in western India. (These two bordering districts will be referred to here as the Banaskantha region, as until recently they were a unified district. An image of the area is shown in FIGURE 1 below.)



FIGURE 1<sup>1</sup>

The districts are located in the northern part of the state, and include large desert regions. The arid environment provides very limited employment opportunities, and activities such as gum collection are often the main sources of income.

In the following pages, the history of the Banaskantha gum collectors will be discussed, showing how they proceeded from an initial “M-M” situation (as will be explained) to that a bilateral monopoly, and finally to the form of a producer group. **The underlying research question is what effect the formation of a producer group has had on gum prices and thus the incomes of women gum collectors in the region.**

Almost all of the information used in this study is based on data supplied by the local women gum collectors, since most of the previous research carried out in this remote area was conducted by SEWA, the Self-Employed Women’s Association. Most of

<sup>1</sup> Miljoshi, (December 2005), Wikipedia: Northern Districts of Gujarat State (India) [Online], Available: [http://en.wikipedia.org/wiki/Image:Map\\_GujDist\\_North.png](http://en.wikipedia.org/wiki/Image:Map_GujDist_North.png) [December 18, 2006]

the gum collectors in these villages are women, and many of them have been organized into producer groups by SEWA.<sup>2</sup>

## Methodology Used to Collect Data

In the previous studies on the Banaskantha gum collectors, surveys and focus group discussions were the main methods employed to collect data. Data used in the present paper were collected from the previous studies conducted over the years ranging from 1992-2005 (as was available), drawing especially from the surveys conducted in 1995<sup>3</sup> and 2003.<sup>4</sup> Additional data was then collected by meeting personally with the SEWA researchers who had been involved in earlier studies in July 2006, and then by conducting focus group discussions with the gum collectors themselves.<sup>5</sup>

By visiting the SEWA Headquarters in Ahmedabad, the author was able to access the earlier studies and arrange to participate in the follow-up study through field research. This involved traveling to the region and interviewing gum collectors and local SEWA leaders (who themselves are or have been gum collectors) in the town of Radhanpur and in Antarnesh Village in Patan District.<sup>6</sup> Due to the limited scope of the follow-up field research, four SEWA members from Radhanpur and ten women in Antarnesh participated in the field research, along with three SEWA researchers from Ahmedabad.

It would have been ideal to collect data over a greater number of years and from a greater number of villages. However, this proved unfeasible given that the remote rural

<sup>2</sup> SEWA is a women's trade union with a Gandhian philosophy that includes small-scale producers, agricultural laborers, service workers, and others. See, among other sources, Kalima Rose, *Where Women Are Leaders: The SEWA Movement in India* (London: Zed Press, 1992).

<sup>3</sup> Mita Parikh, *The Gum Collectors: Struggling to Survive in the Dry Areas of Banaskantha* (Ahmedabad: SEWA Academy, 2000), p. 1-10.

<sup>4</sup> Jignasa Dave, *Struggling for Survival: The Gum Collectors of Gujarat Revisited* (Ahmedabad: SEWA Academy, 2005), p. 1-30.

<sup>5</sup> Ms. Mita Parikh and Ms. Jignasa Dave of SEWA Academy were also interested in participating in this short follow-up field research in order to understand how conditions had changed since their previous studies.

<sup>6</sup> Antarnesh was one of the villages in the original Banaskantha studies. Additional details regarding the methodology used in the follow-up field research are included in Appendix 1.



location of the villages prevented easy tracking of general data from the region. This is even truer for figures such as revenues from gum, costs associated with gum, and demand for and supply of gum. Although recently information related to gum prices in different markets are being tracked by the marketing division of SEWA called *Gram Haat*, even basic data are not always available. This makes data collection difficult and statistics can sometimes be unreliable or simply unattainable.

In addition, particularly in poor households, questions related to income are often considered very personal issues and are not for public discussion. For example, households tend to be sensitive to data such as the assets they own (especially if they are very few), how indebted the household is, or even how much they earn monthly. Questions must be worded in ways such that there is no incentive to withhold such information, and oftentimes the format of the data becomes difficult to use.

For example, instead of finding exact incomes for individuals and then calculating an average income, those surveyed are given *ranges* in which their incomes fall. Although this allows researchers to see changes in the distribution of incomes (i.e., what percentages of those being questioned earn what *ranges* of income), it can be difficult to say much beyond general trends. Again, this is not necessarily a problem, but it makes it difficult to be very precise.

The specific data selected for use in this study appear to be relatively reliable and logical. However, as a result of the ways in which the earlier studies were conducted, only a limited amount of quantitative data was chosen to be included in this study, in order to ensure accurateness and reliability.

This quantitative information was supplemented by a great deal of qualitative data collected through personal interviews in Ahmedabad with SEWA's researchers, marketing division, cooperatives division, and individuals connected with the State Forest Department. Information was also acquired through correspondence with an expert on non-wood forest products and cooperatives.



The qualitative data turned out to be very useful in explaining and analyzing the quantitative data. Qualitative data provide the additional benefit of being more accurate than quantitative data alone when describing a case study involving rural development. However, the drawback is that qualitative information is harder to process and analyze using numerical or quantitative methods, and good statistical analyses cannot be done where the amount of good quantitative data is limited. Nonetheless, the combination of quantitative and qualitative data used in this study does show a change in the gum collectors' market power over time, as will be discussed in detail below.

## **Economic Theories and their Relevance to the Banaskantha Case Study**

In addition to general economic terms and concepts such as theory of the firm, less well-known concepts such as the "M-M Model," "bilateral monopolies" and "producer cooperatives" will be used and will need to be explained before proceeding. What follows are generalized economic theories coupled with discussions of how they apply to the Banaskantha region.

### *The M-M Model*

In the standard theory of the firm, the assumption under perfect competition is that the producer has perfect access to information about prices, and offers goods and services based on market prices. It also assumes that producers are many, do not work together nor have any significant market power (they do not form monopolies or oligopolies<sup>7</sup>), and that buyers do not work together or have significant market power (they do not form monopsonies<sup>8</sup>).

<sup>7</sup> A monopoly occurs when a firm is the sole producer of a specific good, and thus has significant market power. Oligopolies, on the other hand, occur when relatively few firms have the majority of market power, and by colluding can thus operate like a monopoly. Both monopolies and oligopolies are inefficient market structures.

<sup>8</sup> A monopsony occurs when there is only a single buyer in a given market. This buyer has considerable market power and can cause the market to be inefficient.

However, in rural areas of developing countries, these assumptions are not always correct. In his publication “Cooperation as a Method to Increase Agricultural Productivity,” Ungku A. Aziz describes what he calls the “M-M” theory.<sup>9</sup> This is described as a situation where a trader becomes the sole bridge between a small rural economy and the external economy. Although the trader may initially be considered a beneficial addition since he opens up trading opportunities (by connecting local markets to wider state-wide, country-wide or even world-wide markets), in numerous cases he may eventually become a middleman that actually decreases economic gains for the community. He does this by becoming both a monopsonist and a monopolist – hence the term “M-M”. This occurs because traders can gain control of a local market and prevent outsiders from entering the market or locals from expanding out of it. Barriers to entry (such as the trader’s knowledge of the region, connections, relationships with buyers/sellers, and others) allow these traders to gain considerable economic power and deviate from the “laissez-faire” system that is assumed in many standard models.

#### *The M-M Stage in Banaskantha*

Although the “M-M” model Aziz describes arose from a different case study, the underlying situation is very similar. In Banaskantha, women sold gum to the trader for extremely low prices, and the trader would then resell the goods for much higher prices. The trader had achieved the “M-M” status, and high barriers to entry made it difficult for other buyers to enter the market. Because of the low pay for gum and a necessity to buy their goods from the trader, the trader often sold on credit. In essence, the villagers were locked into buying and selling to the trader because they were often in debt to the trader.

However, after being approached by SEWA field workers in 1990, the women were given the opportunity to organize into a producer group. The women eventually joined SEWA and they managed to work together to eliminate the “M-M” trader. Subsequently, through greater negotiating power gained from becoming effectively a

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<sup>9</sup>Ungku A. Aziz, “Cooperation as a Method to Increase Agricultural Productivity,” in The Role of Cooperation in Social and Economic Development, ed. International Cooperative Alliance (New York: Asia Publishing House, 1996), p. 24-26.

union of small-scale producers, they coordinated with the government to obtain identification cards so they could legally collect gum from government forests and sell directly to the government.<sup>10</sup>

### *The Concept of a Bilateral Monopoly*

Furthermore, by unifying their operation the gum collectors gained bargaining power and formed an effective monopoly. However, through this arrangement they were not allowed to sell their gum to anyone but the State Forest Department, making the Forest Department the new monopolist. Thus the producer group now began acting as a kind of local “monopoly” facing a new large monopsony buyer. Here, the model of a bilateral monopoly comes in.

When a monopoly sells to a monopolist, a “bilateral monopoly” is created. Under this condition, any action by the producer group elicits a reaction on the monopolist’s side, and vice versa. The final outcome can be unpredictable: “In practice, the outcome of bilateral monopoly will depend partly on economic logic, partly on the relative power of the union and management, partly on the skill and preparation of the negotiators, and partly on luck.”<sup>11</sup> In other words, due to the multitude of influences and factors that can affect negotiations and price-determination, it is not possible to arrive at a consistent or expected outcome solely using economic theory. FIGURE 2 represents the general situation faced by both parties:<sup>12</sup>

<sup>10</sup> For additional background on gum as a commodity, see Appendix 2.

<sup>11</sup> William J. Baumol and Alan S. Blinder, *Economics: Principles and Policy* (Fort Worth: The Dryden Press, 1994), p. 410.

<sup>12</sup> Campbell R. McConnell and Stanley L. Brue, *Economics: Principles, Problems, and Policies* (Boston: Irwin/McGraw-Hill, 1999), p. 593.



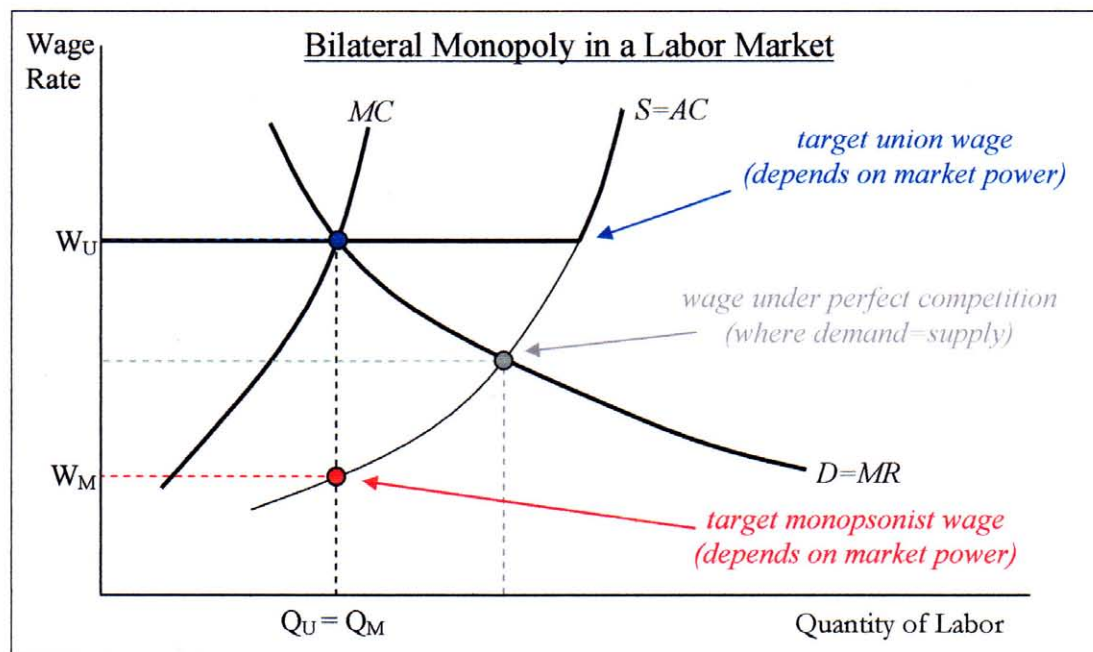


FIGURE 2

The graph in FIGURE 2 is used to illustrate a generalized theory on how a *labor* union will deal with a monopsonist. The monopsonist will attempt to hire a quantity of  $Q_M$  workers at the wage of  $W_M$  (at a low wage rate). On the other hand, the union will attempt to bargain for an above-equilibrium wage of  $W_U$ . Additionally, both parties may target numerous other points on the graph depending on what their goals are, the quantity of labor desired, the relative gains vs. losses at hiring labor at a certain price, and other factors. Ultimately this conflict-of-interest will be settled at the bargaining table at a price somewhere between  $W_M$  and  $W_U$ .

In the case of the Banaskantha gum collectors the situation is slightly different. Technically, instead of dealing with a union of hired labor, the monopsonist is buying from a union of small-scale *producers*. Because of this, certain subtle changes must be made to the initial labor model – specifically, the axes must be changed as shown below in FIGURE 3:



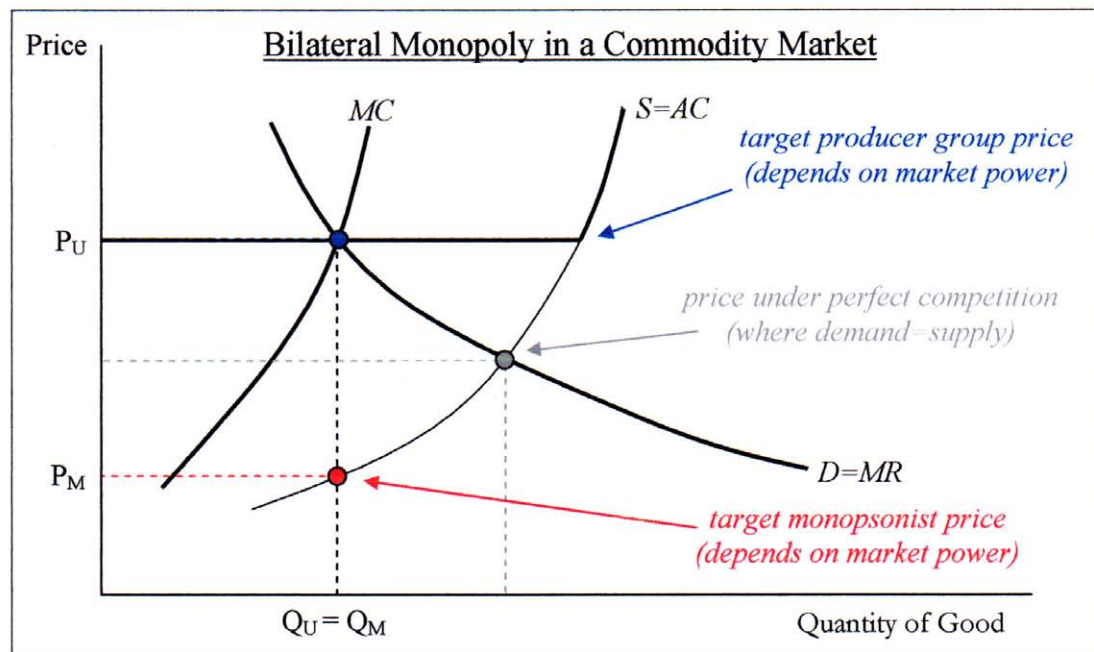


FIGURE 3

Again, the outcome of such a situation will rely largely on negotiations and the particular aims and market power of both parties involved.

#### The Bilateral Monopoly Stage in Banaskantha

In the case of the women gum collectors the women organized into a producer group. Initially, this seemed to be a step forward, but soon certain problems were encountered. The biggest problems involved sudden decreases in gum prices and being paid below-open market prices, as shown in FIGURE 4 (these prices have been adjusted for inflation<sup>13</sup>):

<sup>13</sup> Dave, p. 4. Base year (for inflation adjustment) is 1992.

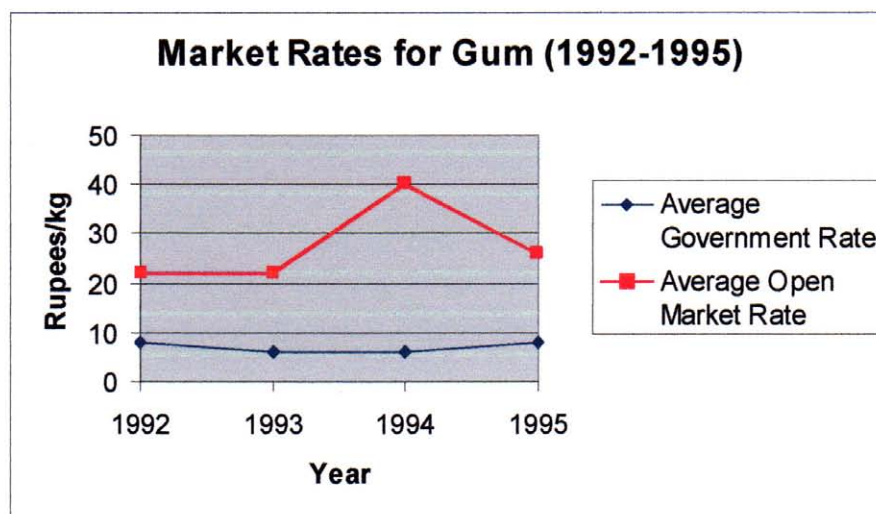


FIGURE 4

In FIGURE 4 we see that although the open market rate increased greatly beginning in 1993, the influx of gum into the Forest Department actually lowered the price offered to the women. There are conflicting accounts as to why this happened: one version is that imports of gum from Sudan pushed the Forest Department to lower the price on gum collected locally. It is said that another possible cause of the price drop was illegal trading. The Forest Department would find potential buyers who would fill out “tenders” with their bids, but some say that the buyers would then illegally collude and all fill in lower bids, thus lowering the prices for gum. This benefited them because they paid less for the good.

Whatever the cause, the low prices made it difficult for the women and their families to survive, given their already deep impoverishment. In an attempt to escape this predicament, the producer groups from all over the area now called on SEWA to convince the government to let them sell on the open market.

#### *The Producer Cooperative Stage in Banaskantha*

In 1997, through extensive negotiations with government officials, the SEWA-connected producer groups won the right to sell directly on the open market. The

producer groups did this by working with the newly-created *Gram Haat*, the marketing division of SEWA.

Initially, Gram Haat, still not completely understanding the market, actually offered them lower prices than the Forest Department, but this changed quickly in 2002 when they began focusing on the quality of gum. Gum collected can be of three qualities – white, red and black. Instead of mixing the gum, Gram Haat taught the women to separate the gum and sell each type of gum individually to obtain higher average prices. The prices from 1999-2005 are shown in FIGURE 5:

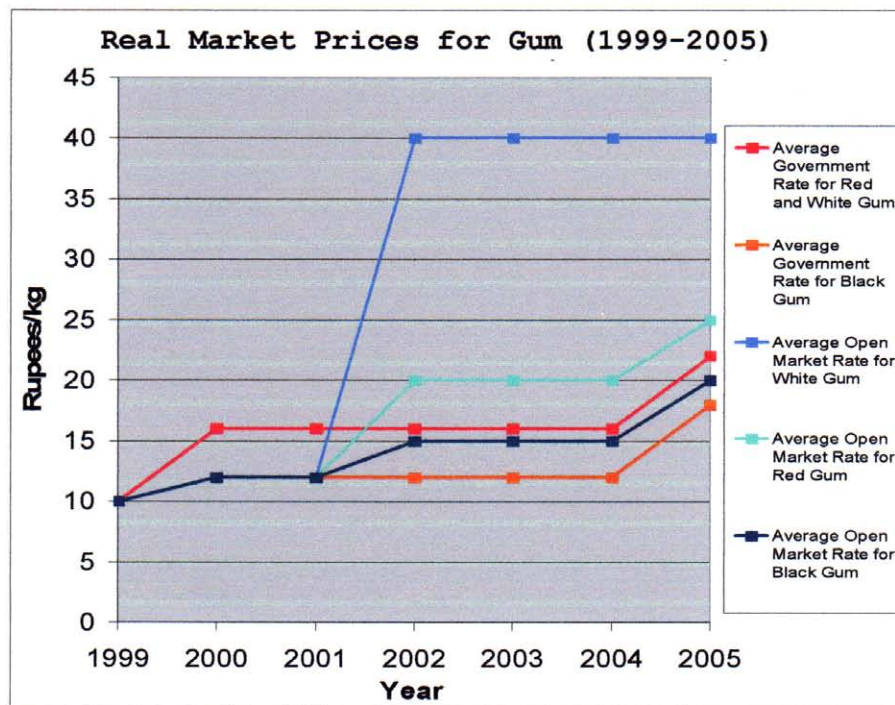


FIGURE 5

In this graph, the two red-shaded lines represent the government's prices, while the three blue lines represent the open market rates attainable via Gram Haat.

Furthermore, the women producers became more efficient in that they moved toward gaining economies of scale and also gained technical and other benefits from joining the SEWA network. Both the women interviewed and the SEWA researchers



detailed how SEWA worked with the Forest Department to provide the collectors with tools to make the process of gum collection more efficient.

In addition, being part of the SEWA network allowed their producer groups to integrate vertically<sup>14</sup> such that normally large costs such as storage and transportation became shared by all participating groups (leading to economies of scale<sup>15</sup>). Furthermore, Gram Haat developed relations with a wide range of buyers, and recently has even tried to create its own brand (called RUDI goods).<sup>16</sup> All of these have been attempts to differentiate the gum product from other products in the market, and have thus moved the market slightly in the direction of monopolistic competition.<sup>17</sup>

At this point the bilateral monopoly model is no longer relevant because when Gram Haat sells in more distant markets, the women face new competition and no longer make up a local monopoly facing a monopsonist. However, the distant markets also offer better prices, and the possibility of developing a brand name in a context of monopolistic competition allows them a degree of market power.

What has emerged is effectively a cooperative. However, at this point the distinction between a producer cooperative and a conventional profit-maximizing firm needs to be clarified.<sup>18</sup>

<sup>14</sup> Vertical integration occurs when a single firm carries out multiple stages in the production of a good. In this case, the SEWA network works with the gum from its initial collection to its final sale to the consumer.

<sup>15</sup> As the firm increases in size, it becomes more efficient such that it can produce a greater quantity of the good for a lower average cost.

<sup>16</sup> Interview with Sheela Sabu of Gram Haat, by Rehan Syed, July 2006.

<sup>17</sup> Monopolistic competition is a situation in which many firms are competitive. There are low barriers to entry, but each firm attempts to differentiate their good from the rest (for example, with a brand name) thus allowing them to gain a certain level of monopoly-like market power.

<sup>18</sup> Technically, the producer group is not registered as a formal cooperative under government law. (Interview with Jaya Vagela of Gujarat State Women's SEWA Co-operative Federation, by Rehan Syed, July 2006.) However, the operation of the producer group in this case is essentially identical to that of the concept of a producer cooperative. For this reason and to be able to relate the situation directly to the underlying theory involved, the producer group will also be referred to here as a cooperative.



*How the Producer Group's Selling Through a Marketing Association on the Open Market Differs from a Profit Maximizing Firm*

The following graph (FIGURE 6) demonstrates the basic conditions of a monopolistically competitive firm:

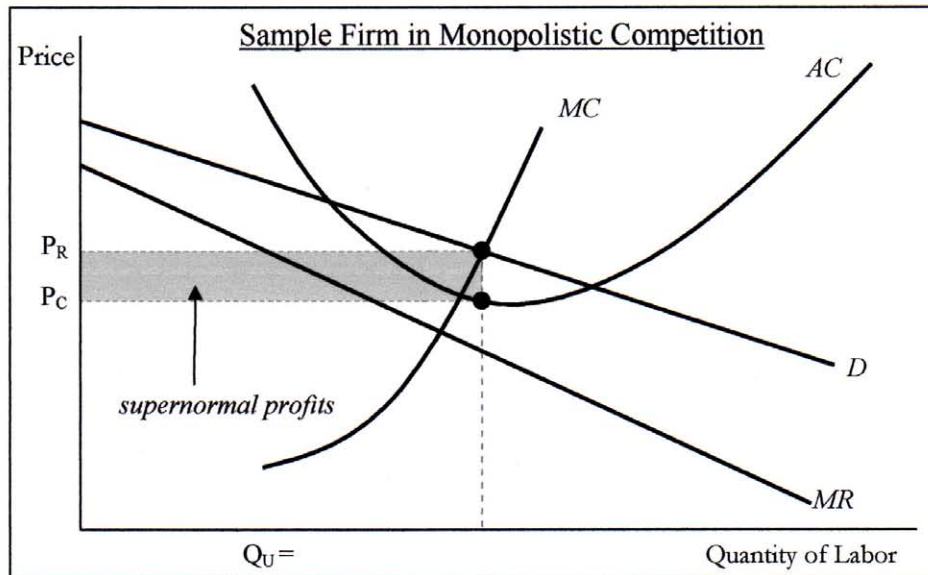


FIGURE 6

From a long-run perspective, the ease of market entry/exit means monopolistically competitive firms will ultimately achieve a normal or break-even profit (where  $P_R = P_C$ ). However, through SEWA the gum collectors seem to have attained enough market power to enjoy supernormal profits ( $P_R > P_C$ ). Still, this analysis may be misleading since the entire concept is somewhat arbitrary in the case of a producer group. A producer group does not treat labor as a “cost” – rather, whatever revenue is left over after paying for transportation, processing, marketing, etc., determines the benefit to the producers.

In other words, a producer cooperative differs greatly from a standard profit-maximizing firm in the way it treats profit. In the case of a profit-maximizing firm, the method of profit maximizing is shown in the following objective function<sup>19</sup>:

<sup>19</sup> David L. Prychitko and Jaroslav Vanek, *Producer Cooperatives and Labor-Managed Systems Volume I* (Brookfield, US: Edward Elgar Publishing, March 1996), p. xiv.

$$\text{Maximize Profit} = \text{Revenue} - \text{Labor Cost} - \text{All Other Costs}$$

On the other hand, a producer cooperative does not attempt to maximize profit – instead, it attempts to maximize “net income per worker/producer.” This is shown in the following equation<sup>20</sup>:

$$\text{Maximize Net Income per Worker/Producer} = \left( \frac{\text{Revenue} - \text{All Other Costs}}{\text{Number of Workers/Producers}} \right)$$

In the second equation, “Revenue – All Other Costs” does not include a “labor cost.” Again, in the common profit maximizing model of the firm, labor *is* considered a cost, and since one wants to minimize costs, labor is considered nothing more than an input. In contrast, in the case of a producer cooperative, the workers/producers are the ones benefiting and therefore one does not necessarily want to minimize “labor” – instead, one wants to maximize net income *per* “worker” (or producer). This is done in a number of different ways depending on the exact case, but usually net profit is distributed to those who helped produce the good in proportion to what they produced – in other words, the more an individual produces, the more they benefit.

It is this exact principle that the SEWA’s producer group and *Gram Haat* have adopted. SEWA members are first paid upon delivering the gum to Gram Haat according to the quality and quantity of the product. Later, once the gum has been sold and a profit received, the remaining profit is shared among the producers again according to their relative contribution.<sup>21</sup>

## Changes in Income and Living Standards of Gum Collectors

A major question that remains is whether SEWA’s attempt to increase income and standards of living for its members in the Banaskantha region has actually worked. It is

<sup>20</sup> Prychitko and Vanek, p. xiv.

<sup>21</sup> For more information on the sequence of payments and sharing of profits, see Appendix 3.

true that gum prices have gone up, which would seem to indicate the women are receiving higher incomes. However, it is impossible to calculate income with only prices, since quantities also need to be considered.

Due to the lack of/inaccessibility of records in the area, it was not possible to collect exact statistics on quantities over time. However, it inferentially seemed that the quantity of gum collected had gone up for a number of reasons. First, a theory known as “capital deepening” is relevant here. The theory states that when capital (in this case, equipment) is invested and the output per worker (here, per producer) increases, then capital deepening has occurred.<sup>22</sup>

Initially gum collection was relatively difficult because the *ganda-bawal* plant is covered with poisonous thorns. Cases existed where individuals cut by thorns were unable to work for up to six months. Additionally, dehydration from a lack of water in the arid region under very high temperatures has resulted in deaths when individuals were out collecting gum. This caused them to stop collecting early to prevent dehydration.

Through SEWA and the State Forest Department, gum workers were provided with capital in the form of bags for holding gum, long poles with machetes attached to help reach past the thorns, and water pouches to prevent dehydration. According to the women interviewed, this greatly increased the output of gum per producer – they could work longer hours, and be more efficient for each hour they work.

In addition, the opportunity for higher profits (due to higher prices) increased the incentive to gather gum. There is evidence that more female family members became involved in the work.<sup>23</sup> This means greater quantities of gum produced by each household, which along with higher prices and thus revenues (without any change in

<sup>22</sup> Peter B. Meyer, (No Date), Online Glossary of Research Economics [Online], Available: <http://www.econterms.com> [September 24, 2006]

<sup>23</sup> Dave, p. 9.



costs), necessarily results in more income per household, as can be seen in FIGURE 7 based on 1995 and 2003 data<sup>24</sup>:

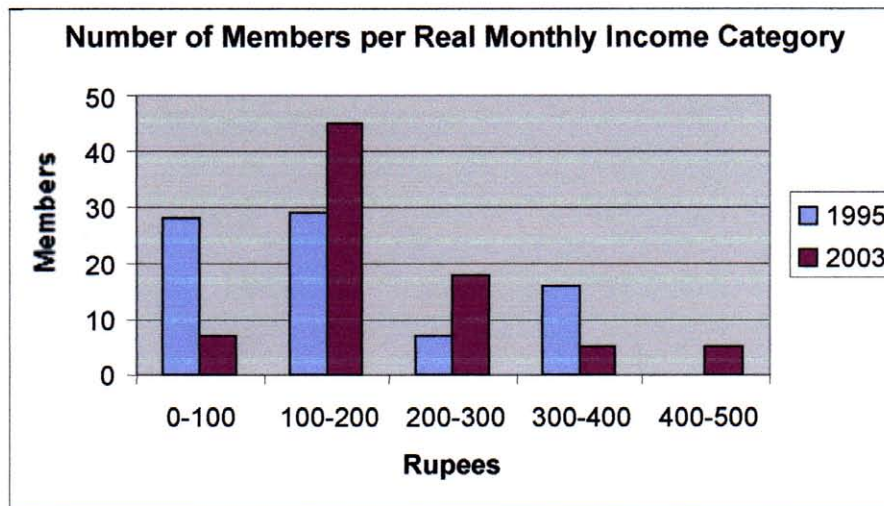


FIGURE 7

This data roughly reveals the following in FIGURE 8 to be true:

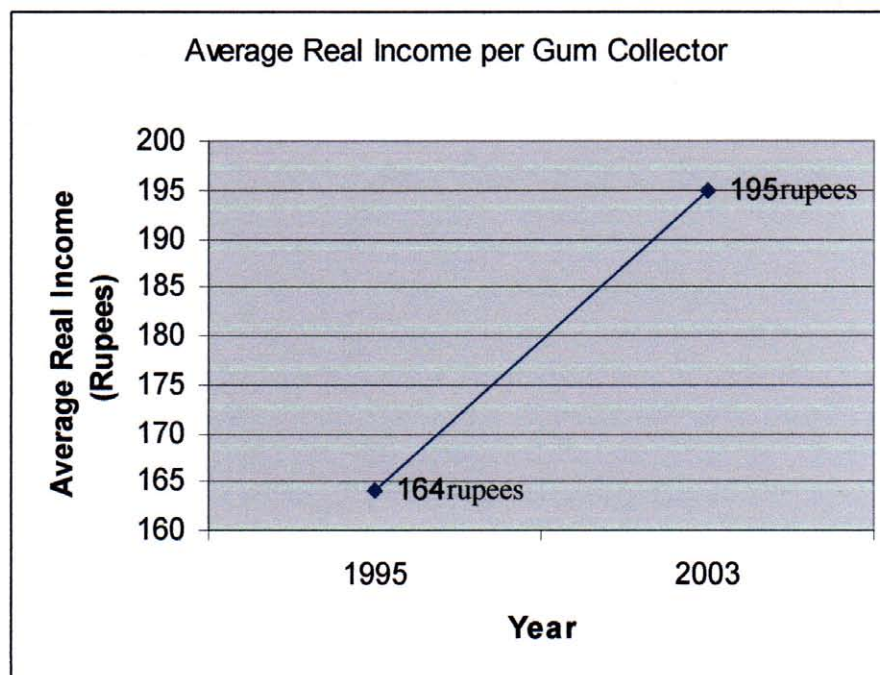


FIGURE 8

<sup>24</sup> Dave, p. 12.



This income chart shows the changes in income from 1995-2003, which represents the changes SEWA membership has created to the benefit of its members. Clearly, the incomes of most members were at the lower end of the spectrum in 1995 (the majority earning between 0-200 rupees monthly). However, by 2003 more were earning a higher monthly income (specifically, the mean real income per gum collector rose from 164 rupees in 1995 to 195 rupees in 2003).

## Conclusions

**The initial research question asked was whether the creation of a producer group would help the Banaskantha gum collectors sell their product at higher prices, and thus increase their average incomes.** Ultimately, it appears that by becoming a producer group, gum collectors were able to attain higher incomes. The formation of a producer group helped in numerous ways, as it allowed the gum collectors to escape from the inefficient “M-M” scenario and, after negotiating with the local government monopoly, sell on the open market. The result has been greater market power, more efficient production (with economies of scale), and a variety of benefits offered by the SEWA network (including technical help, information, marketing, low-interest loans, services for community development, and other forms of support).

As stated above, the data suggest that real and not just nominal income levels have increased over the time period. However, there remains one unresolved question – does this higher income necessarily mean that their standard of living has increased? While the answer would presumably be “yes,” it is worth noting that simple growth is not always equivalent to development. Ideally one would wish to use an index that would combine multiple statistics that would indicate changes in the standard of living. Unfortunately, for a remote region like Banaskantha, such data are difficult to come by. However, we do know that the SEWA-affiliated gum collectors interviewed in the follow-up field research report that there have been significant improvements in their quality of life after joining SEWA and forming a producer group. They report that

benefits include greater access to childcare and children's education, the distribution of cell phones, the rebuilding of houses after an earthquake, and greater access to credit, savings groups, and other services.

Although it is difficult to prove this due to the lack of good quantitative data, the quantitative data available together with qualitative data suggest that economic circumstances and the standard of living did improve for the gum collectors after forming a producer group that is part of a network of such groups and cooperatives (through SEWA). However, further research and figures could confirm this view.

Of course, a new question emerges – will the operation of a producer group continue to be favorable to the gum collectors? It remains to be seen if the situation of the gum collectors continues to improve or if problems with the operation of a producer group are found, but currently there is nothing to suggest the latter. However, one potential problem is the fact that the land from which the gum collectors collect their gum is not owned by the collectors, but by the government. Recently, the government has indicated that it may take actions against the growth of *ganda-bawal* plants because they have been labeled as an “invasive species” that may indirectly affect water tables and possibly harbor mosquitoes (although they do help fight further desertification). Still, at present no such actions have been taken, and future policies could go in any direction.

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## Appendices

### Appendix 1 Additional Details Regarding Methodology Used in the Follow-up Field Research

Field research for the follow-up study was carried out through the following procedures. The author first formulated a questionnaire in English, and then Ms. Mita Parick and Ms. Jignasa Dave of SEWA Academy translated it into Gujarati (the local language). The author, Ms. Parick, Ms. Dave, and one other researcher associated with SEWA, went to interview SEWA leaders and members based in the town of Radhanpur, and then the SEWA leader in the village of Antarnesh (all who are or have been gum collectors themselves). Following this, the questionnaire was administered to an additional ten village-based gum collectors in the village of Antarnesh. The data was then translated back into English, and finally there was an open discussion about topics the women brought up. The author and SEWA researchers then returned to Ahmedabad, and the author conducted further interviews in the city.

There were possible drawbacks to collecting data in this manner. First, the need to translate limited the ease of communication, yet few technical issues actually arose. Second, although the initial studies on the Banaskantha region covered a focus group of 80 people from nine different villages, the sample size of participants in the focus group discussion in Antarnesh for the follow-up research was relatively small. In spite of this, the discussions with SEWA Academy researchers and local SEWA leaders, along with other knowledgeable SEWA and State Forest Department members, were able to supplement these interviews and helped clarify a few of the points made in the earlier studies. They also helped pinpoint changes that had occurred since the last time a study was conducted in the area.



*Follow-up field research: focus group discussion in Antarnesh (SEWA members, local leaders, and researchers)*



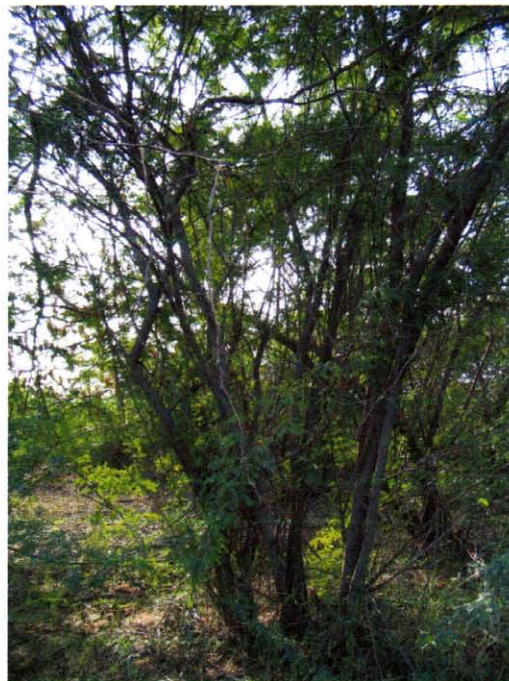
## Appendix 2 Background on Gum as a Commodity

As a good, gum is relatively easy to produce. Due to the nature and abundance of the *ganda-bawal* plant (*Prosopis juliflora* – a type of mesquite that grows in arid regions), gum collection entails few or no sunk costs or other issues that would otherwise prevent it from being collected. It also can survive with minimal care (no irrigation or other costs) as it grows naturally in wild, harsh environmental conditions. Because of its use in the prevention of further desertification, the Gujarat State Forest Department has until very recently been encouraging the growth of the *ganda-bawal* plant in arid areas of the state, particularly on Forest Department lands.

However, there are a few physical dangers to collecting gum as the plants are thorny and poisonous. In many cases, injuries associated with gum collection can result in months of inability to work. Additionally, working in the arid countryside poses the risk of heat stroke and dehydration.

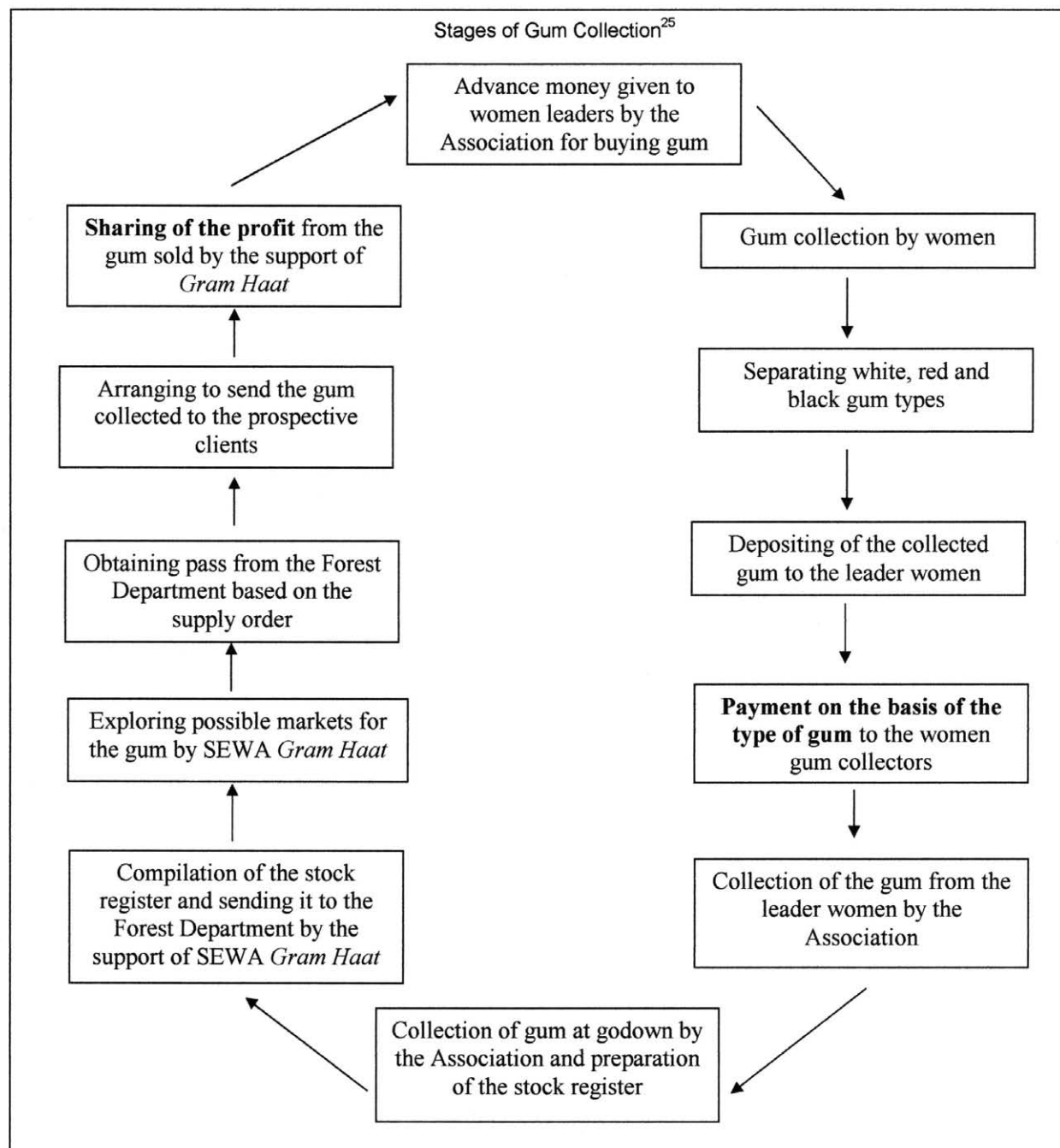
Apart from these potentially very serious dangers, the only other “cost” of producing gum is opportunity cost, since gum collection requires extensive hours of labor. Although it might appear that the activity has a high opportunity cost (it usually takes 6-10 hours of work), when one considers the other options available in the region it is clear that gum remains a good investment of time.

Lastly, it should be noted that there are three variants of gum that can be collected – white (the most valuable), red, and black (least valuable) gum. However, for the purpose of this paper all three have been generally referred to as a single good (“gum”).



*The Prosopis juliflora (ganda-bawal) plant*

## Appendix 3 The Stages of Gum Collection



<sup>25</sup> Jignasa Dave, *Struggling for Survival: The Gum Collectors of Gujarat Revisited* (Ahmedabad: SEWA Academy, 2005), p. 29. As seen above, the women gum collectors are paid twice – first at the time of collection, and later at the time of profit sharing, based on final market prices and their relative contributions.